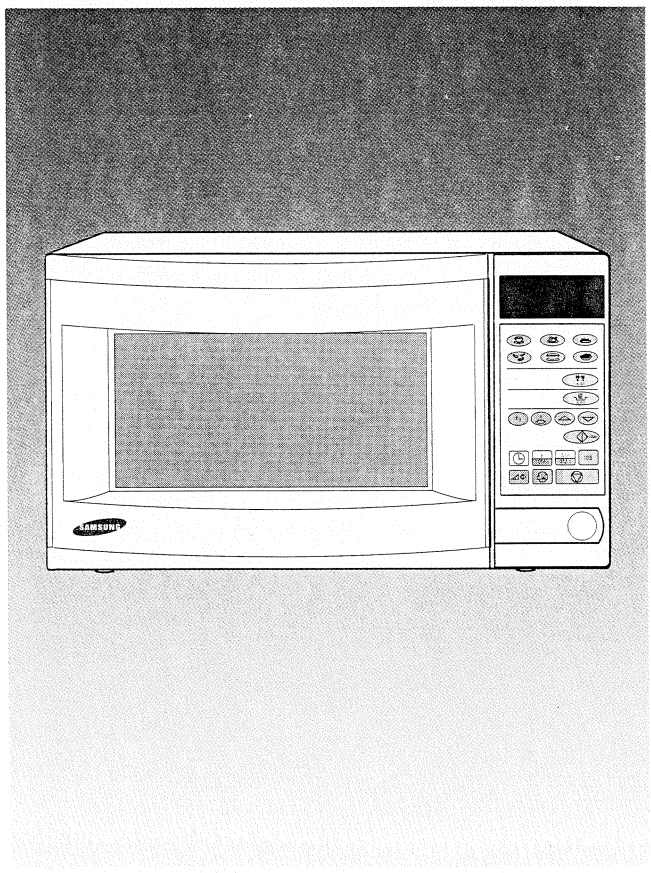
SAMSUNG

MICROWAVE OVEN

MB245

SERVICE Manual

MICROWAVE OVEN



CONTENTS

1. PRECAUTIONS & SPECIFICATIONS 2
2. COMPARING CHART & CONTROL PANEL 3
3. FEATURES & EXTERNAL VIEWS 4
4. OPERATION INSTRUOCTION 5
5. WIRING DIAGRAM 8
6. CAUTIONS OBSERVED WHEN SERVICING 9
7. CIRCUIT DESCRIPTIONS 10
8. COMPONENT TEST PROCEDURE 11
9. MEASUREMENTS & ADJUSTMENTS 12
10. LEAKAGE MEASURING PROCEDURE 13
11. TROUBLESHOOTING 14
12. EXPLODED VIEW 16
13. PARTS LIST 17
14. PCB DIAGRAM 18
15. PCB PARTS LIST 19

C.T.EUROPE

1. PRECAUTION

1-1. Safety Precaution (!)

1) Pacemaker wearers must consult their physician before attempting to service or repair a microwave oven. For additional advice on this subject, write to the manufacturer of your pacemaker.
2) The product should be serviced only by qualified personnel.
3) Though the product has been manufactured in compliance with the Federal performance Standard 21 CFR Subchapter J(DHHS), it is very important when servicing to avoid being exposed to excessive microwave radiation. All the repairs should be performed in accordance with the procedures described in this manual.
4) Use only the iidentical parts as listed in the parts list of this manual in order to comply with the Federal performance Standard 21 CFR Subchapter J(DHHS).
5) In the event of suspected imcrowave energy leakage in excess of 5mW/cm2, please notify;
   CENTRAL SERVICE CENTER
6) Repair microwave oven at no charge to the owner for excessive microwave emission levle.
7) Ascertain the cause of the excessive leakage and instruct the owner not to use the unit until the oven has been brought into compliance.
8) If the oven is operated with the door open, please advise the owner not to use the oven and contact the manufacturer and CDRH immediately.
9) There are special components used in the microwave oven which are important for safety. These parts are marked with a on the replacement parts list. It is essential that these critical parts should be replaced only whith the manufacture's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the original design.

1-2. Servicing Precaution (☞)

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID 0POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

1. Do not attempt to operate the oven or allow it to be operated with the door open.
2. Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and then make repairs as necessary:
   (A) Interlock operation
   (B) Proper door closing
   (C) Seal and sealing surfaces (arcing, wear, or other damages)
   (D) Damage to or loosening of hinges and latches
   (E) Evidence of dropping or abuse.
3. Before turning on the microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity and connections.
4. Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired or adjusted by procedures described in this manual before releasing the oven to the owner.
5. A microwave leakage check should be performed on each oven prior to releasing to the owner.

2. SPECIFICATIONS

SPECIFICATIONS

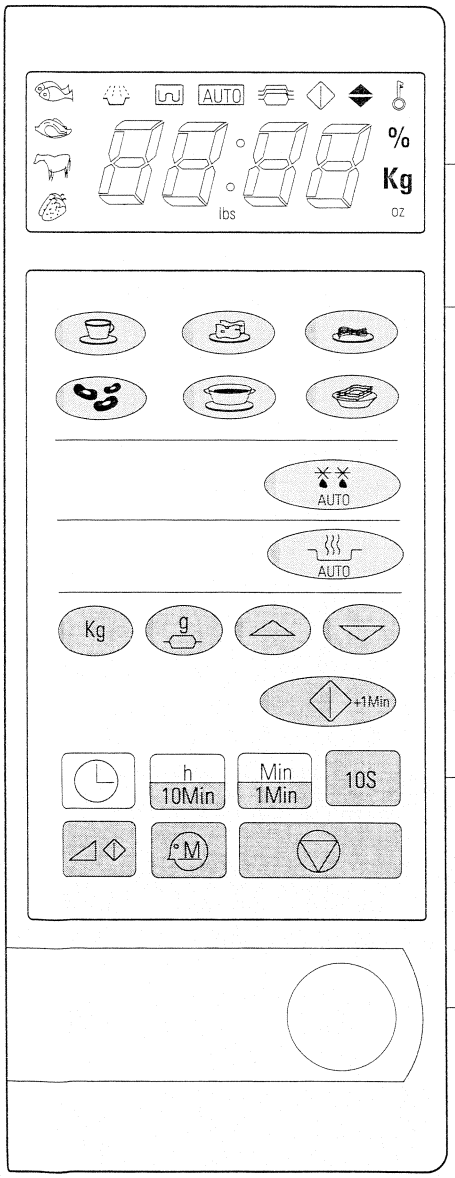
TIMER	99 MINUTES 90 SECONDS
POWER SOURCE	230V 50Hz, AC
POWER CONSUMPTION	MICROWAVE : 1,650W
OUTPUT POWER	100W/1000W(10 LEVEL POWER) (IEC-705 TEST PROCEDURE)
OPERATING FREQUENCY	2,450MHz
MAGNETRON	OM75P(31)
COOLING METHOD	COOLING FAN MOTOR
OUTSIDE DIMENSIONS	547(W) x 327(H) x410(D)

POWER LEVEL		ON TIME	OFF TIME
10%	100W	4 sec	26 sec
20%	200W	7 sec	23 sec
30%	300W	10 sec	20 sec
40%	400W	13 sec	17 sec
50%	500W	16 sec	14 sec
60%	600W	19 sec	11 sec
70%	700W	22 sec	8 sec
80%	800W	25 sec	5 sec
90%	900W	28 sec	2 sec
100%	1000W	30 sec	0 sec

3. COMPARING CHART

FEATURE \ MODEL	MB245
MORE/LESS	○
AUTO COOK/DISH	○
AUTO DEFROST	○
TIME COOK	○
POWER LEVEL	○
INSTANT COOK	○
MEMORY	○
BOOST	○
CHILD LOCK	○
CLOCK	○

4. CONTROL PANEL



Window display and indicator lights

Function selector buttons

*Instant cook

*Auto defrost

*Auto cook

*Kg,g,more and less

*Start and boost

*Clock

*Memory

*Power level and time cook

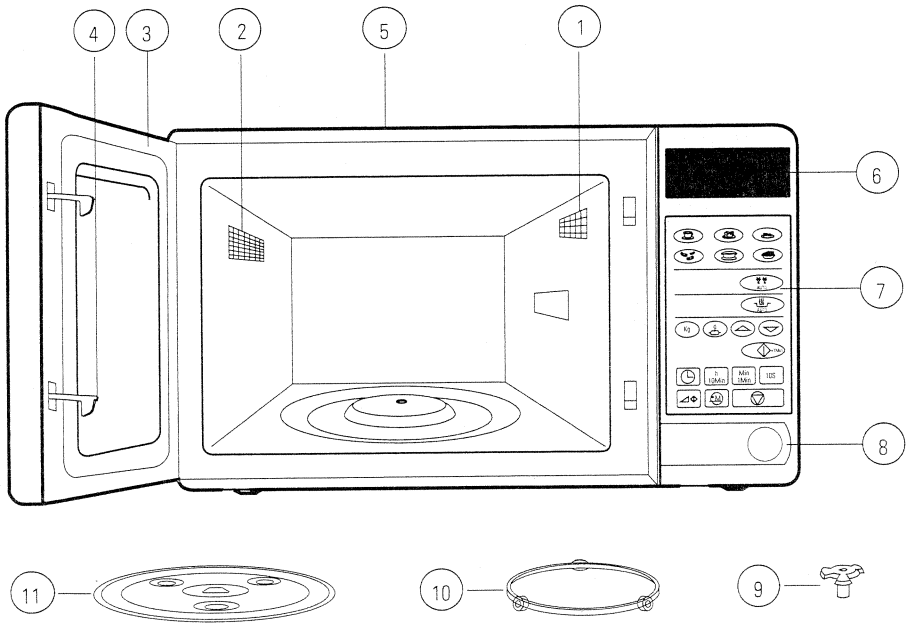
*Timer set

*Cancel

Door open button

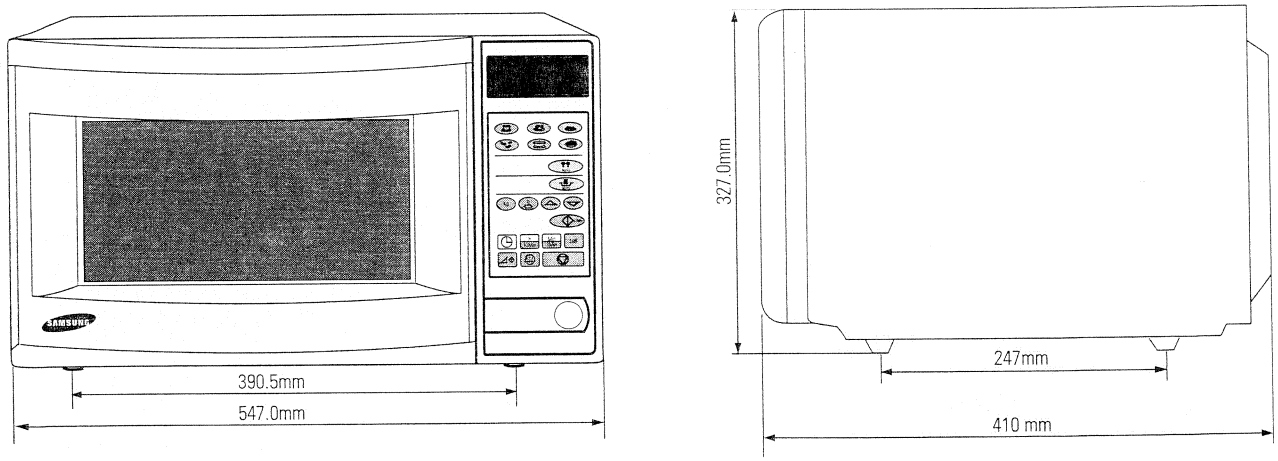
C/P

5. FEATURES & EXTERNAL VIEWS



1. Interior Oven Lamp
2. Ventilation Openings
3. Oven Door (to view food being cooked)
4. Door latches and safety interlock
5. Model No. & Serial No.
6. Display
7. Membrane Panel
8. Door open button
9. Coupler
10. Guide Roller
11. Cooking Tray

FEATURES



EXT-MB245

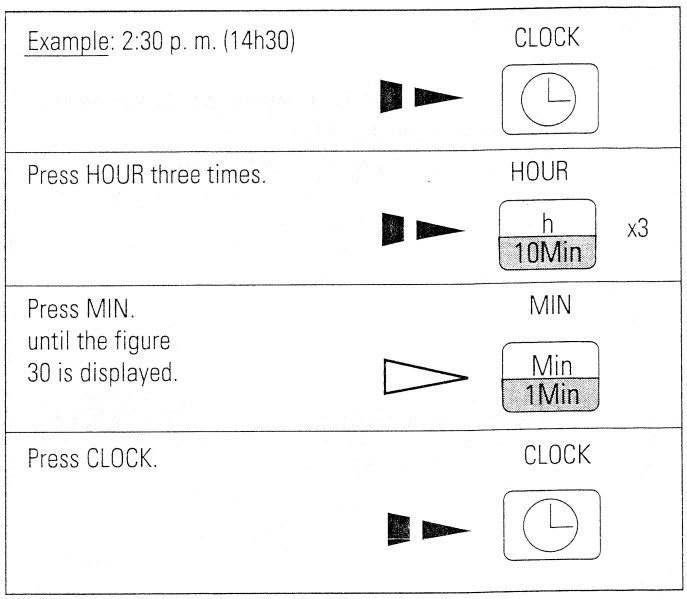
6.OPERATION INSTRUOCTION

Setting the Time

Your microwave oven has a 24-hour and 12-hour colck, you must set the clco:
*** When you first install your microwave oven**
*** After a power failure**

NOTE: Do not forget to reset the clcok when you switch from summer to winter time and vice versa.

1) Press CLOCK button once, the display indicates 24H.
   If you press CLOCK button twice, the display indicates 12H.
2) To set the hour, press the HOUR button the appropriate number of times or hold the button down until the correct figure is displayed.
3) To set the minutes, press the MIN. button the appropriate number of time, or hold the button down until the correct figure is displayed.
4) When the right time is displayed, press CLOCK to start the clock.
   Result: The correct time is displayed whenever you are not using the microwave oven.

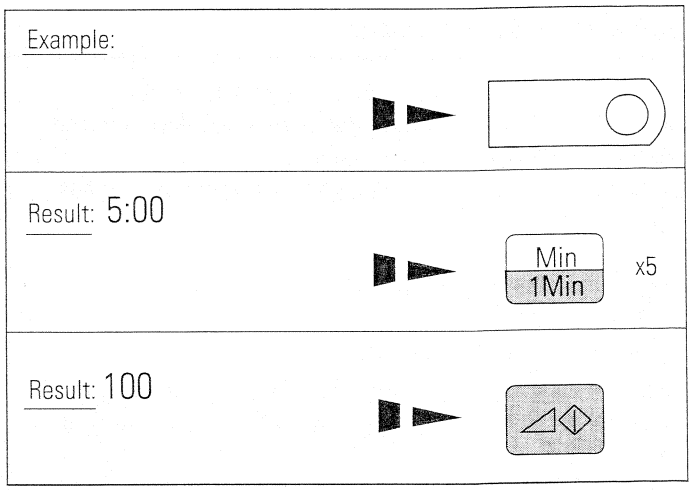


Checking that Your Oven is Operating Correctly

The following simple procedure enables you to check that your oven is working correctly at all times. If you are in doubt, refer to the table below.

NOTE: The oven must be plugged into an appropriate wall socket. The glass plate must be in position in the oven. If a power level other than the maximum (100%) is used, the water will take longer to boil.

1) Open the oven door by pushing the OPEN DOOR button. Place a glass of water on the glass plate.
   Close the door.
2) Set the time to 4 to 5 minutes by pressing the 1 Min. button.
3) Press the POWER LEVEL button once.
   Result: The oven heats the water for 4 to 5 minutes. The water should then be boiling. The figure 100(maximum power) is displayed. After 2 seconds, the remaining cooking time will be shown on the display.

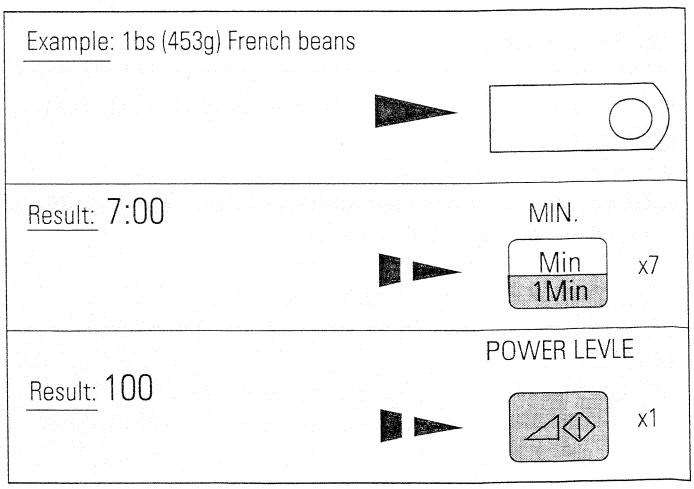


Cooking/Reheating with the Microwave Oven

The following simple procedure explains how to cook or reheat food. For more information on the actual power level and time to be selected, refer to the tables opposite and the cooking guide later in this booklet.

IMPORTANT: ALWAYS check your cooking settings before leaving the oven unattended.

1) Open the door by pushing the OPEN DOOR button. Place the food in the centre of the glass plate. Close the door.
2) Select the cooking time by pressing the 10 Min., 1 Min. or 10 Sec. buttons as required.
3) Select the appropriate power level by pressing the POWER LEVEL button until the corresponding figure is displayed.
   Result: Cooking starts and the selected time starts counting down. At the end, you hear four beeps and the current time is displayed again.



Adjusting the Cooking Tiem During Cooking

Like traditional cooking, you may find that depending on the food's characteristics or your tastes, you have to adjust the cooking times slightly.

You can:

- *** Check how cooking is progressing at any time simply by opening the door**
- *** Add extra minutes simply by pressing + 1M**

Stopping the Cooking

You can stop cooking at any time so that you can:
* Check the food
* Turn the food over or stir it
* Leave it to stand

To stop the cooking...	Press...
Temporarily	OPEN DOOR. To resume cooking, close the door and pressSTART.
Completely	CANCEL.

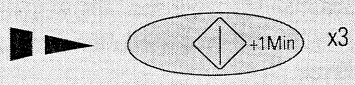
You can also cancel any cooking settings before starting cooking; simply press CANCEL.

Adding Extra Time

If you check your food and find that it needs to be cooked a little longer, do not need to repeat all the settings.

Simply press +Min once for each extra minute you wish to add.

Example: To add three minutes, press +Min three times.



Whenever you press +1M button, cooking time will increase minute by minute.

Auto Defrosting Food

This feature allows you to defrost meat, prultry or fish.
With the Auto Defrost feature, the oven automatically sets the defrosting time and power levels.
Enter the food weight in kilograms. Use the Auto Defrost Guide.

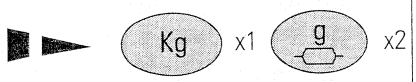
1) Place the frozen food in the oven and close the door.
2) Press AUTO DEFROST.
   Result: The display indicates 0.0
3) Enter the food weight by holding down the Kg, g buttons. Control the defrost condition by pressing the▲or ▼ buttons as required.
4) Press START.
   Result: Defrosting begins and the time counts down. The oven beeps ten times and will stop operating at the half way stage of an auto-weight defrost programme. Turn the food over and press START. When defrosting has finished, the oven beeps four times.

Example: Defrosting 1.2kg of stewing steak in cubes.

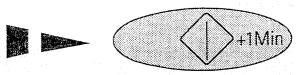
AUTO DEFROST

Result: 0.0

Result: 1.2



Result: The meat is defrosted.



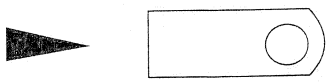
IMPORTANT Allow 20~40 minutes standing time.

Instant Cook

With the instant cook feature, the oven automatically sets cooking time.
No need to touch START.
The serving size is automatically set at 1, but can be changed by touching instant cook pad.

1) Place the milk in the oven and close the door.
2) Select the serving size by pressing the DRINKS button as required.
   Result: Cooking starts after about 2 seconds and the time displayed starts counting down. At the end, you hear four beeps.

Example: 600ml Milk



Result: 3:30

Auto Cook

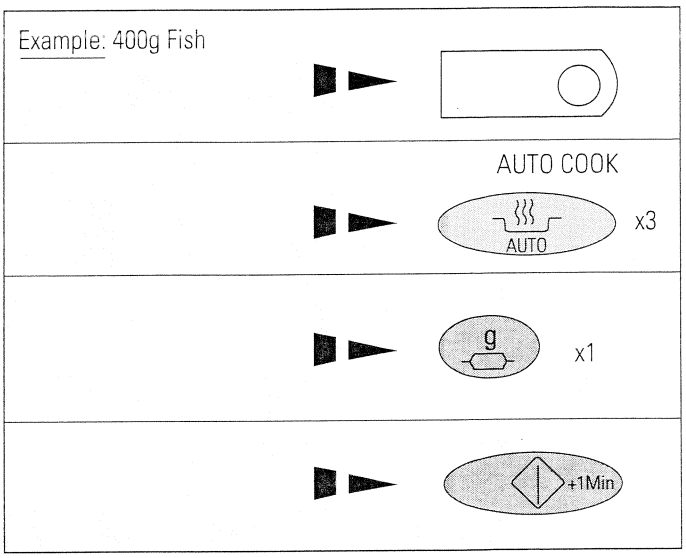
The Auto cook function has six pre-programmed cooking times. Everything is automatic, neither cooking nor power levels has to be set.
The Serving size is automatically set at 1, but can be changed by touching g pad.

1) Place the Fish in the oven close the door.

2) Select the code for AUTO COOK button.

3) Select the serving size by pressing the g button as required and then control the cooking condition by ▲ or ▼ (see Auto Cook Guide)

4) Press START.
The oven will operate automatically in accordance with the Auto cooking programme selected.



Memory Cooking

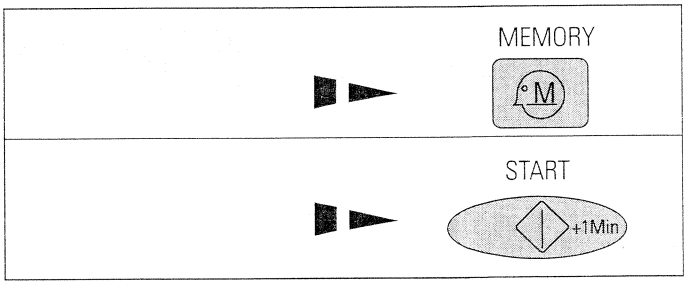
The cooking times and power levels for foods that are cooked frequently can be programmed and stored in the oven's memory.

MEMORY ENTRY

1) Touch the MEMORY pad.

2) Set your cooking programme following the instructions book

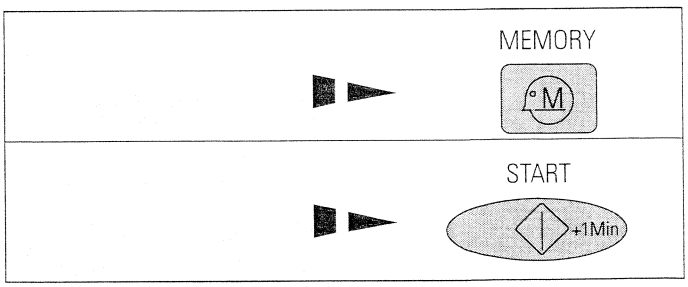
3) Touch the Start Pad your favourite recipe is now set and entered in the Memory.



MEMORY START

1) Touch the MEMORY pad.

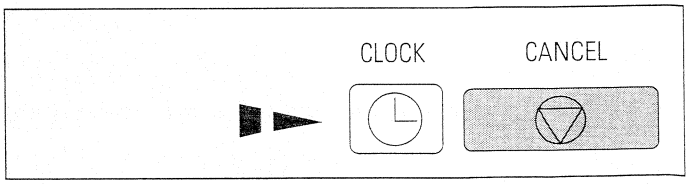
2) Touch the START pad.



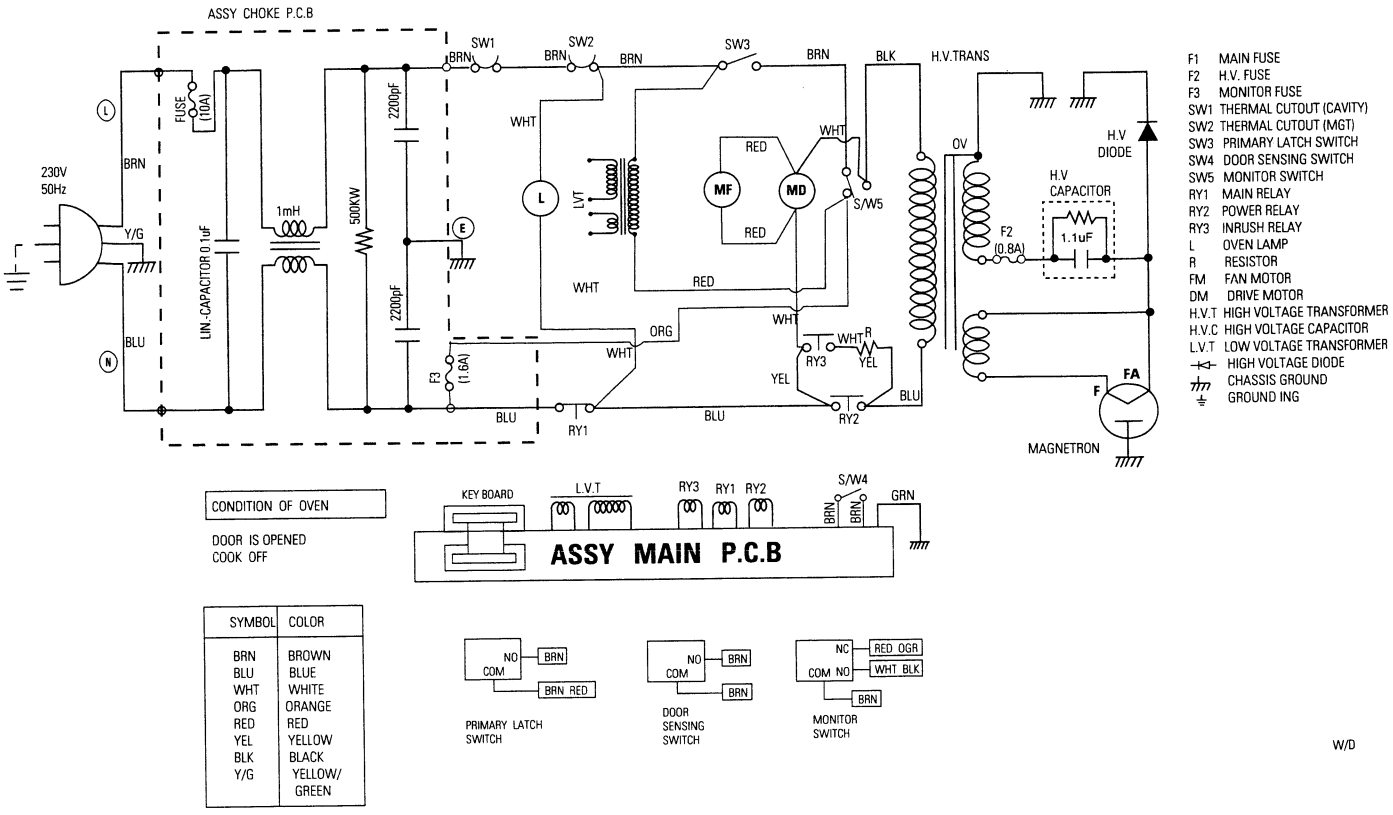
Child Safety Programme

Your microwave oven incorporates a special Child Safety programme which enables the oven to be "locked" to prevent children or anyone unfamiliar with the oven from operating it.
The oven can be "locked" at anytime.

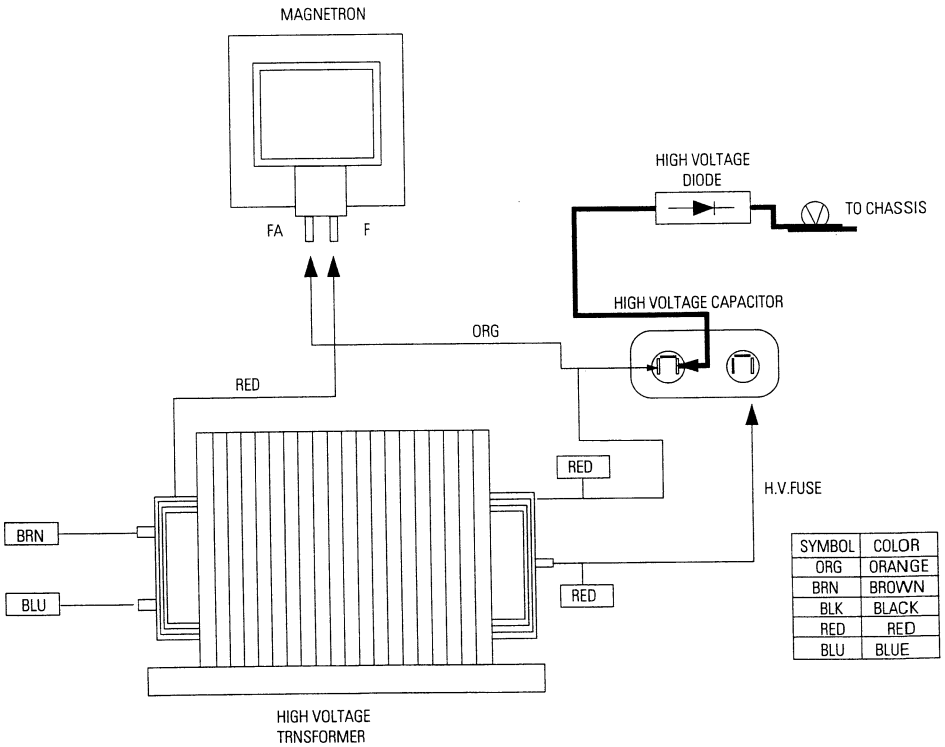
1) Press the CLOCK and CANCEL pads together. The oven will be "locked" and a key symbol will appear in the display. To cancel the child lock press CLOCK and CANCEL pads together. The key symbol will disappear.



7. WIRING DIAGRAM



SYMBOL	COLOR
BRN	BROWN
BLU	BLUE
WHT	WHITE
ORG	ORANGE
RED	RED
YEL	YELLOW
BLK	BLACK
Y/G	YELLOW/ GREEN



SYMBOL	COLOR
ORG	ORANGE
BRN	BROWN
BLK	BLACK
RED	RED
BLU	BLUE

W/D-1

8. CAUTIONS OBSERVED WHEN SERVICING

Unlike many other appliances, the microwave oven is high-voltage, high current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

PRECAUTION

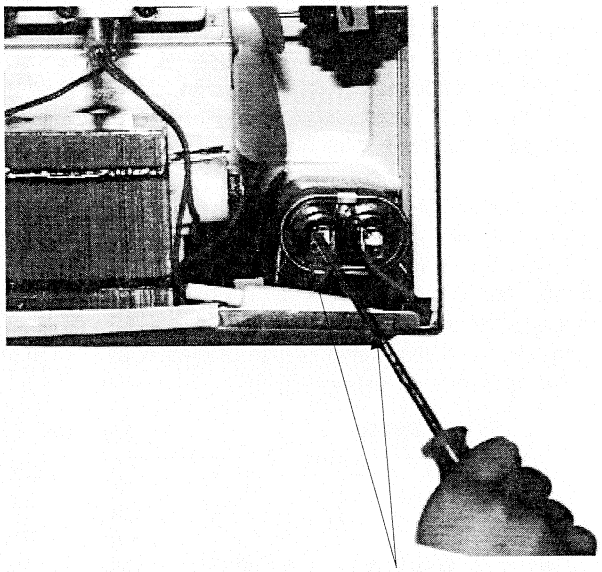
Servicemen should remove their watches whenever working close to or replacing the magnetron.

8-1. Check the ground.

Do not operate on a 2-wire extension cord. The microwave oven is designed to be used when grounded. It is imperative, therefore, to make sure that the oven should be grounded prior to repair.

8-2. Warning about the electric charge in the high voltage capacitor

As an electric charge in the high voltage capacitor remains for about 30 seconds after operation stops, short the current between the oven chassis and the negative terminal of the high voltage capacitor, by using a screwdriver before replacing or checking parts.



☞ : Touch chassis side first then short to the high voltage capacitor terminal by using a screwdriver or jumper wire.

8-3. When parts must be replaced, remove the power plug from the outlet

8-4. When the 1.6 Amp fuse is blown out by the operation of the interlock Monitor switch:

(A) Replace the primary, door sensing and interlock monitor switches. This is mandatory. Refer to page 12 for the necessary adjustments of these switches.

(B) When replacing the fuse, confirm that it has the appropriate rating for this model.

8-5. Avoid inserting any foreign materials, etc. through any hole in the unit during operation.

Never insert any foreign materials or any other metal object through the lamp hole on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.

8-6. Confirm after repair:

(A) After repair or replacement of parts, make sure that screws of the oven are neither loose nor missing; to prevent the microwave leakage.

(B) Make sure that all electrical connections are tight before inserting the plug in to the wall outlet.

(C) Check for radiation leakage. (Refer to the procedure for measuring energy leakage in page 13.)

PRECAUTION

There exists HIGH VOLTAGE ELECTRICITY with high current capabilities in the circuits of the HIGH VOLTAGE TRANSFORMER secondary and filament terminals. It is extremely dangerous to work on or near these circuits with the oven energized.

DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

PRECAUTION

Never touch any circuit wiring with your hand nor with an insulated tool during operation.

9. CIRCUIT DESCRIPTIONS

Refer to the wiring diagram on page 8.

1. When food is placed inside oven and door is closed

(A) Low voltage transformer supplies necessary voltage to the touch control circuit when power cord is plugged in.

(B) The primary interlock switch is closed.

(C) The interlock monitor switch is opened. This interlock monitor switch acts to blow 10A fuse and stop magnetron oscillation when the door is opened during operation under an abnormal condition. (i.e. the contacts of door sensing switch do not open and the contacts of secondary interlock switch do not close the circuit to stop oscillation)

(D) The door key is caught by the door hook, the door sensing switch is closed to send the door-close signal to the touch control circuit.

2. When cooking cycle, power and time are set by touching the function pads

(A) The time set appears in the display window.

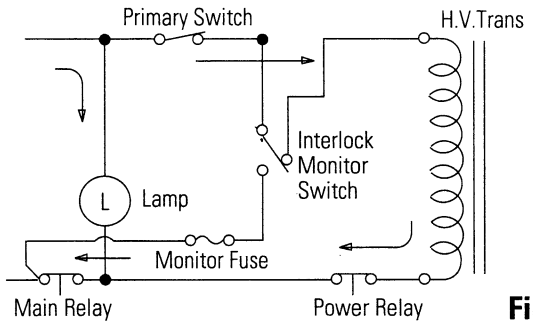
(B) The touch control circuit stores the cooking data set.

3. When the START pad is touched

The main relay and the power control relay are controlled by the touch control circuit.

(A) An oven lamp lights the inside of the oven by operation of the main relay in the Touch Control Circuit.

(B) Fan motor rotates and cools the magnetron by blowing the air coming from the intake on the back panel over the magnetron fins. After cooling the fins, this air is directed into the oven to blow out the vapor.



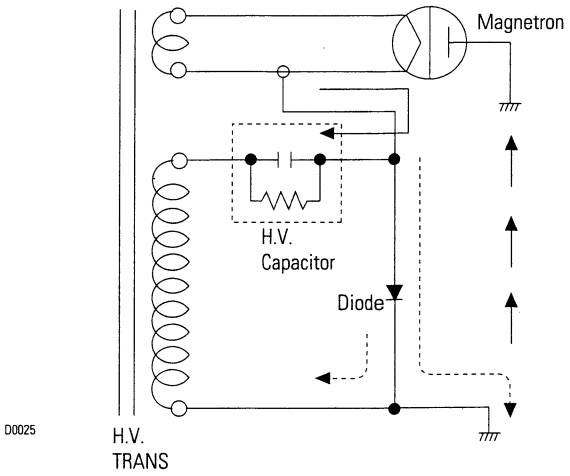
C/D

Fig. 1

(C) 230V~50Hz AC is applied to the high voltage transformer through the contacts of primary windings as shown by the solid line just after the power control relay turns ON. (Fig. 1)

(D) 3.4V AC is generated from the filament winding of the high voltage transformer. This 3.4V is applied to the magnetron to heat the magnetron filament through two noise preventing choke coils.

(E) High voltage of 2,230 volts AC is generated from the high voltage transformer secondary and this secondary voltage is increased by the action of the diode and the charging of the high voltage capacitor. This resultant D.C. voltage is then applied to the anode of the magnetron. As shown in the Fig. 2, the first half cycle of the high voltage produced in the secondary high voltage transformer charges the high voltage capacitor.The dotted lines indicate the current flow. During operation of the second half cycle, the voltage produced by the transformer secondary and the charge of the high voltage capacitor are combined and applied to the magnetron as shown in the solid line so that magnetron starts to oscillate. The interference wave generated from the magnetron is prevented by the 1.6uH choke coils, 500pF filter capacitors and the magnetron's shielded case so that TV and radio signals are not interfered with.



D0025

Fig. 2

(F) The power control relay is turned on intermittently by the touch control circuit, when the oven is set at any power except for full power. The touch control circuit controls the ON/OFF time of the power control relay in order to vary the output power of the microwave oven from Low to "Full" power. One complete ON/OFF cycle of the power control is 30 seconds.

(G) The cooking time shown on the display start to count down.

4. When the door is opened during cooking

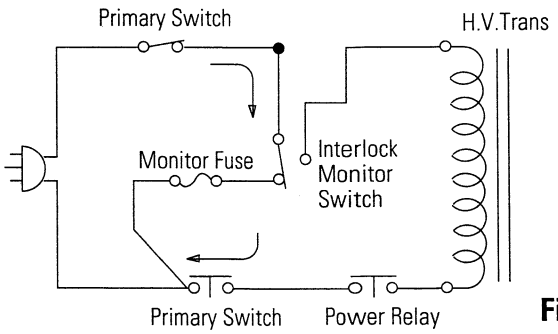
(A) The primary interlock switch is opened to cut off the primary voltage of the high voltage transformer to stop microwave oscillation.

(B) The door sensing switch is opened to give the door open information to touch control circuit. The main relay stays on, the power control relay turns off and the display stops counting down.

(C) The fan motor and turn-table motor are stopped by operation of the primary or secondary interlock switch. But the oven lamp lights the inside of the oven again until the door is closed.

(D) Upon opening the door, the contacts of primary interlock switch open and the contacts of interlock monitor switch close the short circuit.

(E) If the contacts of primary interlock switch do not function properly, the monitor1 fuse blows out due to the large current surge caused by the monitor switch activation, and this in turn stops magnetron oscillation. (Fig. 5)



C/D

Fig. 3

5. When the CANCEL pad is touched during cooking

(A) Once touching of the CANCEL pad stops the time cooking. Twice touching of the pad cancels all programs stored in the touch control circuit. The time of day reappears on the display window.

(B) The oven lamp and cooking indicators turn off.

(C) The fan motor stops.

(D) The power control relay turns off to cut primary voltage to high voltage transformer so that the magnetron stops oscillation.

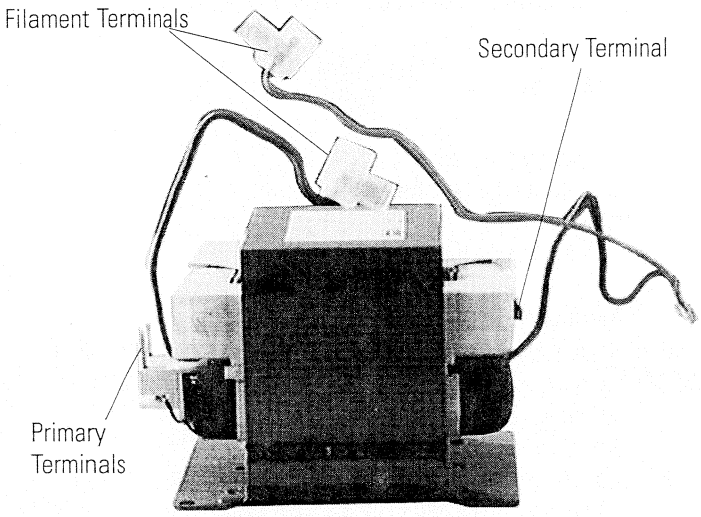
10. COMPONENT TEST PROCEDURE

PRECAUTION

1. High voltage is present at the high voltage terminal of the high voltage transformer during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

10-1. High Voltage Transformer

1) Remove connectors from the transformer terminals and check continuity.
2) Normal resistance readings should be as follows:
   Secondary.....Approx. 94Ω
   Filament.....Approx. 0Ω
   Primary.....Approx. 1.6Ω
   (Room temperature = 20°C)



10-2. Low Voltage Transformer

The low voltage transformer is located on the control circuit board.

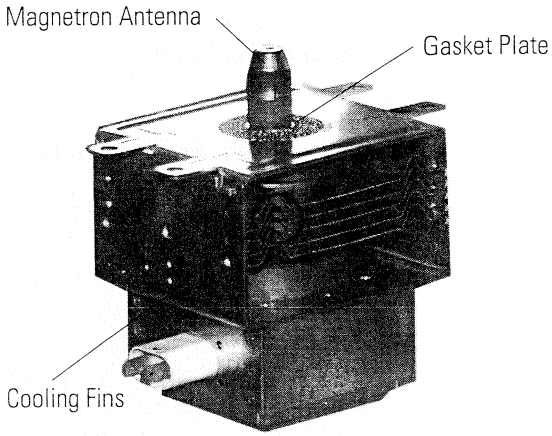
1) Remove the low voltage Transformer from the PCB Ass'y and check continuity.
2) Normal resistor reading should be as follows.

Terminals	Resistance
1~2(Input)	1000Ω
3~4(Output 2.9V)	3.947Ω
5~6(Output13V)	2.117Ω

10-3. Magnetron

Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose an open filament or shorted magnetron;

1) Isolate the magnetron from the circuit by disconnecting its leads.
2) A continuity check across the magnetron filament terminals should indicate one ohm or less.
3) A continuity check between each filament terminal and magnetron case should read open.



P0047

10-4. High Voltage Capacitor

1) Check continuity of the capacitor with meter set at the highest ohm scale.
2) Once the capacitor is charged, a normal capacitor shows continuity for a short time, and then indicates 9MΩ.
3) A shorted capacitor will show continuous continuity.
4) An open capacitor will show constant 9MΩ.
5) Resistance between each terminal and chassis should read infinite.

10-5. High Voltage Diode

1) Isolate the diode from the circuit by disconnecting its leads.
2) With the ohm-meter set at the highest resistance scale, measure the resistance across the diode terminals. Reverse the meter leads and read the resistance. A meter with 6V, 9V or higher voltage batteries should be used to check the front-to back resistance of the diode, otherwise an infinite resistance may be read in both directions. The resistance of a normal diode will be infinite in one direction and several hundred KΩ in the other direction.

10-6. Main Relay and Power Control Relay

The relays are located on the PCB Ass'y.

1) Isolate the relays from the main circuit by disconnecting the leads.
2) operate the microwave oven with a water load in the oven and the power level set to high.
3) Check continuity between terminals of the relays after the start pad is pressed.

11. MEASUREMENTS & ADJUSTMENTS

Precaution

For continued protection against radiation hazard, replace parts in accordance with the wiring diagram and be sure to use the correct part number for the following switches.: Primary and secondary interlock switches and the interlock monitor switch all together. Then follow the adjustment procedures below. After repair and adjustment, be sure to check the continuity of all interlock switches and the interlock monitor switch.

11-1. Adjustment of Primary Switch, Door Sensing Switch and Monitor Switch

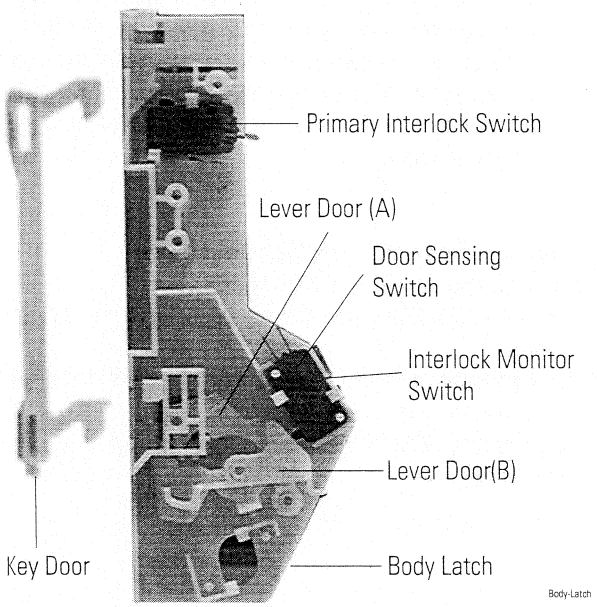
1) When mounting Primary switch and interlock Monitor switch to Latch Body, consult the figure below.

NOTE: No specific adjustment during installation of Primary switch and Monitor switch to the latch body is necessary.

2) When mounting the Latch Body to the oven assembly, adjust to the Latch Body by moving it so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the Latch Body to the oven assembly.

3) Reconnect to Monitor switch and check the continuity of the monitor circuit and all latch switches again by following the components test procedures.
Please confirm that the gap between the switch housing and the switch actuator is no more than 0.5mm when door is closed.

	Door Open	Door Closed
Primary switch	∞	0
Monitor switch (COM-NC)	0	∞
Monitor switch (COM-NO)	∞	0
Door Sensing S/W	∞	0



Body-Latch

11-2. Output Power of Magnetron

The output power of the magnetron can be simply measured by performing a water temperature rise test.

Equipment needed for the test:

* Two 1-liter cylindrical borosilicate glass vessel (Outside diameter of 190mm)
* One glass thermometer with mercury column

NOTE: Check line voltage under load. Low voltage will lower the magnetron output. Make all temperature and time tests with accurate equipment.

(A) Fill the one liter glass vessel with one liter of water.

(B) Stir water in glass vessel with thermometer and record glass vessel's temperature as T1. (10±1°C)

(C) After moving the water into another glass vessel, place it on the center of the cooking tray. Set the oven to high power and operate for 44 seconds exactly. (2 seconds included as a holding time of magnetron oscillation)

(D) When heating is finished, stir the water again with the thermometer and measure the temperature rise as T2.

(E) Subtract R1 from T2. This will give you the water temperature rise. (ΔT)

(F) The output power is obtained by the following formula;

$$\text{Output Power} = \frac{4.187 \times 1000 \times \Delta T}{42}$$

44 : Heating Time (sec)
4.187 : Coefficient for Water
1000 : Water (cc)
ΔT : Temperature Rise (T2-T1)

*** Output (W) = 100 x ΔT**

(F) Normal temperature rise for this model is 9°C to 11°C at 'HIGH'.

NOTE 1: Variations or errors in the test procedure will cause a variance in the temperature rise. Additional power test should be made if temperature rise is marginal.

NOTE 2: Output power in watts is computed by multiplying the temperature rise (step E) by a power factor of 91 in case of centigrade temperature.

11-3. Microwave Heat Distribution - Heat Evenness

The microwave heat distribution can be checked by indirectly measuring the water temperature rises at certain positions in the oven as directed below.

(1) Prepare five beakers made of 'Pyrex', having 100 milliliters capacity each.

(B) Measure exactly 100milliliters off water load with a measuring cylinder and pour it into each beaker.

(C) Measure the temperature of each water load. (Readings shall be taken to the first place of decimals.)

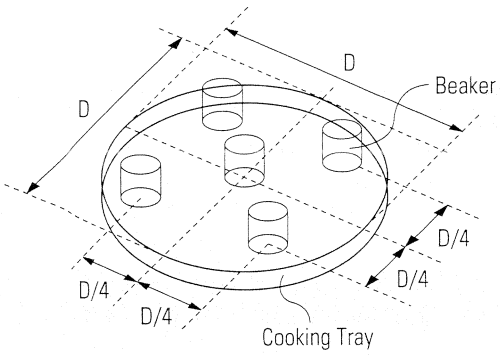
(D) Put each beaker in place on the cooking tray as illustrated in Figure below and start heating.

(E) After heating for 2 minutes, measure the temperatures of water in each beaker.

(F) Microwave heat distribution rate can be obtained by the following formula.

$$\text{Heat Distribution} = \frac{\text{Minimum Temperature Rise}}{\text{Maximum Temperature Rise}} \times 100(\%)$$

The result should exceed 65%.



CAUTION

MICROWAVE RADIATION

PERSONNEL SHOULD NOT BECOME EXPOSED TO MICROWAVE RADIATION FROM MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

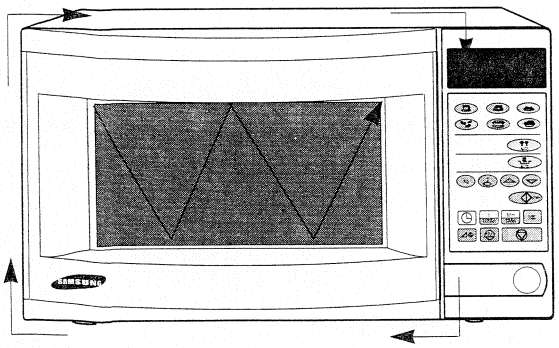
12. LEAKAGE MEASURING PROCEDURE

12-1. Equipment

* Microwave Energy Survey Meter
* 600cc glass beaker
* Mercurial or digital thermometer 100°C or 212°F

12-2. Procedure for Measurement of Microwave Energy Leakage

1) Pour 275±15cc of 20±5°C (68±9°F) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.
2) Start to operate the oven and measure the leakage by using a microwave energy survey meter.
3) Set survey meter with dual ranges to 2,450MHz.
4) When measuring the leakage, always use the 2 inch spacer cone with the probe. Hold the probe perpendicular to the cabinet door. Place the spacer cone of the probe on the door and/or cabinet door seam and move along the seam, the door viewing window and the exhaust openings moving the probe in clockwise direction at a rate of 1 inch/sec. If the leakage testing of the cabinet door seam is taken near a corner of the door, keep the probe perpendicular to the areas making sure that the probe end at the base of the cone does not get closer than 2 inches to any metal. If it gets closer than 2 inches, erroneous readings may result.
5) Measured leakage must be less than 5mW/cm^2, after repair or adjustment.

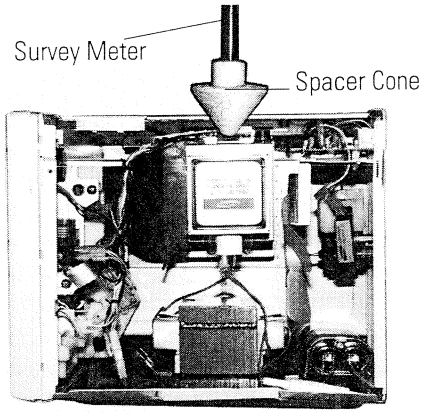


12-3. Check for Microwave Energy Leakage with Outer Panel Removed.

1) Remove the outer panel.
2) Pour 275±15cc of 20±5°C(68±9°F) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.
3) Start to operate the oven at the highest power level.
4) Set survey meter with dual ranges to 2,450MHz.
5) By using the survey meter and spacer cone as described above, measure around the opening area of magnetron, the surface of the air guide and the surface of the wave guide as shown in the following photo but avoid the high voltage components. The meter should read less than 5mW/cm^2.

12-4. Note on Measurement

1) Do not exceed the limited scale.



WARNING

AVOID THE HIGH VOLTAGE COMPONENTS.

2) The test probe must be held on the grip of the handle, otherwise a false reading may result when the operator's hand is between the handle and the probe.
3) When high leakage is suspected, do not move the probe horizontally along the oven surface; this may cause damage to the probe.
4) Follow the recommendation of the manufacturer of the microwave energy survey meter.

12-5. Record keeping and notification after measurement

1) After adjustment and repair of a radiation preventing device, make a repair record for the measured values, and keep the data.
2) If the radiation leakage is more than 5mW/cm^2 after determining that all parts are in good condition, functioning properly and the identical parts are replaced as listed in this manual, notify that fact to;

CENTRAL SERVICE CENTER

12-6. At least once a year have the Microwave Energy Survey Meter checked for accuracy by its manufacturer.

13. Troubleshooting

PRECAUTION

1. CHECK GROUNDING BEFORE CHECKING FOR TROUBLE.
2. BE CAREFUL OF THE HIGH VOLTAGE CIRCUIT.
3. DISCHARGE THE HIGH VOLTAGE CAPACITOR.
4. WHEN CHECKING THE CONTINUITY OF THE SWITCHES OR TRANSFORMER, DISCONNECT ONE LEAD WIRE FROM THESE PARTS AND THEN CHECK CONTINUITY WITHOUT THE POWER SOURCE ON. TO DO OTHERWISE MAY RESULT IN A FALSE READING OR A DAMAGE TO YOUR METER.
5. DO NOT TOUCH ANY PART OF THE CIRCUIT OR THE TOUCH CONTROL CIRCUIT BOARD, SINCE STATIC ELECTRIC DISCHARGE MAY DAMAGE THIS CONTROL PANEL. ALWAYS TOUCH GROUND WHILE WORKING ON THIS TO DISCHARGE ANY STATIC CHARGE BUILT UP IN YOUR BODY.

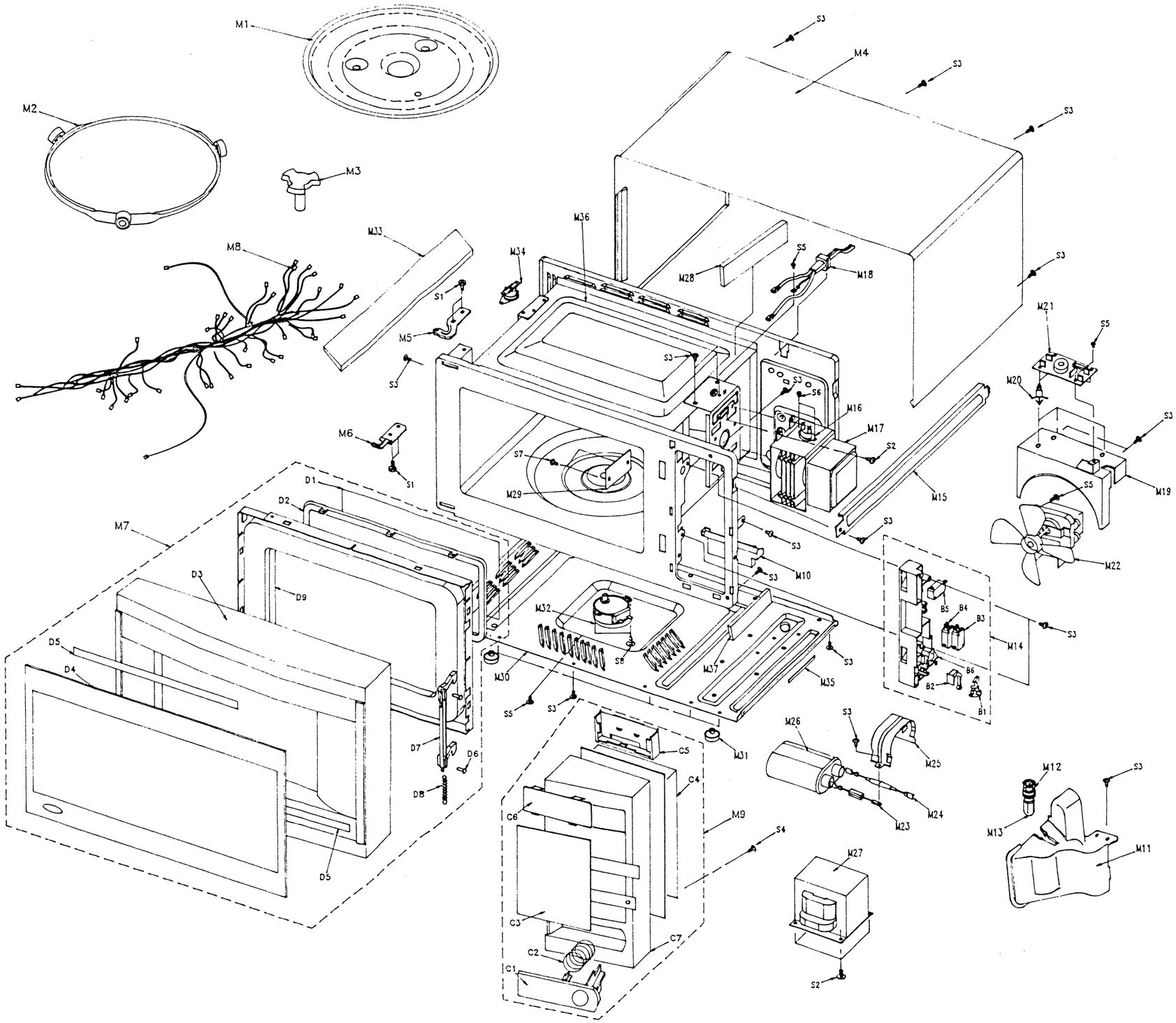
First of all operate the microwave oven by observing the correct operating procedures by time cooking in order to find the exact cause of any trouble.

13-1. Problems not Related to Defects of the Oven

	SYMPTOM	CAUSE	CORRECTIONS
1	Oven is dead. Fuse is OK. No display and no operation at all.	1. Open or loose lead wire harness 2. Open thermal cutout(Magnetron) 3. Open low voltage transformer 4. Defective Ass'y PCB	Check fan motor when thermal cutout is defective. Check Ass'y PCB when LVT is defective.
2	No display and no operation at all. Fuse is blown.	1. Shorted lead wire harness 2. Defective primary latch switch(NOTE 1) 3. Defective monitor switch (NOTE1) 4. Shorted HVCapacitor 5. Shorted HVTransformer (NOTE2)	Check adjustment of primary, interlock monitor, door sensing switch.
		NOTE 1: All of these switches must be replaced at the same time. (refer to adjustment instructions) Check continuity of power relay contacts and if it has continuity, replace power relay also. NOTE 2: When HVTransformer is replaced, check diode and magnetron also.	
3	Oven does not accept key input(Program)	1. Key input is not in-Sequence 2. Open or loose connection of membrane key pad to Ass'y PCB 3. Shorted or open membrane panel 4. Defective Ass'y PCB	Refer to operation procedure. Replace PCB main.
4	Timer starts countdown but no microwave oscillation. (No heat while oven lamp and fan motor turn on.)	1. Off-alignment of latch switches 2. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Large contact resistance will bring lower magnetron filament voltage and cause magnetron to lower output and/or intermittent oscillation. 3. Defective high voltage components H.V.Transformer H.V.Capacitor H.V.Diode, H.V.Fuse Magnetron 4. Open or loose wiring of power relay 5. Defective primary latch switch 6. Defective power relay or Ass'y PCB	Adjust door and latch switches. Check high voltage component according to component test procedure and replace if it is defective. Replace PCB main.

	SYMPTOM	CAUSE	CORRECTIONS
5	Oven lamp and fan motor turn on	1. Misadjustment or loose wiring of primary latch switch 2. Defective primary latch switch	Adjust door and latch switches.
6	Oven can program but timer does not start.	1. Open or loose wiring of secondary interlock switch 2. Off-alignment of primary interlock 3. Defective secondary interlock S/W	Adjust door and interlock switches.
7	Microwave output is low. Oven takes longer time to cook food.	1. Decrease in power source voltage. 2. Open or loose wiring of magnetron filament circuit. (Intermittent oscillation)) 3. Aging change of magnetron	Consult electrician.
8	Fan motor turns on when plugged in	Loose wiring of door sensing switch	Check wire of door sensing switch.
9	Oven does not operate and return to the plugged in mode.	Defective Ass'y PCB	Replace PCB main.
10	Loud buzzing noise can be heard.	1. Loose fan and fan motor 2. Loose screws on H.V.Transformer 3. Shorted H.V.Diode	Tighten screws of fan motor. Tighten screws of H.V.Transformer. Replace H.V.Diode.
11	Turntable motor does not rotate.	1. Open or loose wiring of turntable motor. 2. Defective turntable motor.	Replace turntable motor.
12	Oven stops operation during cooking	1. Open or loose wiring of primary interlock switch 2. Operation of thermal cutout(Magnetron)	Adjust door and latch switches.
13	Sparks	1. Metallic ware or cooking dishes touching on the oven wall. 2. Ceramic ware trimmed with gold or silver powder also causes sparks.	Educate your customer. Do not use any type of cookware with metallic trimming.
14	Uneven cooking	Uneven intensity of microwave due to its characteristics.	Wrap thinner parts of the food with aluminum foil. Use plastic wrap or cover with a lid. Stir once or twice while cooking foods such as soup, cocoa, or milk.
15	Clock noise from the turntable motor when it starts to operate.	The noise may result from the motor.	Replace turntable motor.

Exploded View MB245(CTW)



Parts List - Main Parts

Ref. No.	Parts No.	Description/Specification	Q'ty	Remarks
M 1	73602-0008-00	TRAY-COOKING;GLASS T5.0 PI345 1250G M551T	1	
M 2	79362-0281-03	ASSY-GUIDE ROLLER;D16.5 STD	1	
M 3	71444-0017-00	COUPLER;PTFE 12G WHT MB245	1	
M 4	72061-0015-01	PANEL-OUTER;C/STEEL T0.6 W405.5 L1180.8 SC-WH-01-B	1	
M 5	73094-0036-01	HINGE-UPPER;SCP1 T3.0 W26 L76 WHT COAT MB245/MW653	1	
M 6	73094-0035-01	HINGE-LOWER;SCP1 T3.0 W24.7 L91.2 WHT COAT MB245/M	1	
M 7		ASSY DOOR;MB245(SAW) P/WHT	1	S. N. A
M 8	79202-0361-00	ASSY WIRE HARNESS-A;230V50HZ M9245	1	
M 9		ASSY CONTROL-BOX;230V50HZ MB245(SAW) P/WHT	1	S. N. A
M 10	71533-0015-00	LEVER-DOOR;POM(F20-01) NTR MW5630T	1	
M 11	73312-0124-00	COVER-AIR;NYLON#66 100G MB245	1	
M 12	76609-200-228	SOCKET-LAMP;E/14(22.225)	1	
M 13	B4158-0023	LAMP;T25 230V 25W E14 PHILIPS	1	
M 14		ASSY BODY LATCH;M8145G	1	S. N. A
M 15	73073-0035-00	SUPPORTER-MGT;SECC T0.6 W38 L342.5 MW6630T	1	
M 16	A3024-0077	SW-THERMO;NT-101NA(5XV)P 125V15A V 150/60 23.8MM 2	1	
M 17	77059-0018-00	MAGNETRON;OM75P(31)ESS	1	
M 18	79243-0072-03	ASSY POWER CORD;KKP-4819D/B206 250V10A L1500 1.0MM	1	
M 19	73312-0127-00	COVER-BLOWER;SECC T0.8 W139 L71	1	
M 20	76659-200-518	SUPPORT-P.C.B;DASS-T9N	3	
M 21	79179-0043-00	ASSY NOISE FILTER;250V50/60HZ SS-599B NO LEAD	1	
M 22	76822-0049-01	MOTOR-FAN;AMM92-002AUEB 230V0.2A 2550RPM	1	
M 23	72169-219-108	DIODE-H.V;HVR-1X-32B-12	1	
M 24	79163-0196-00	ASSY-H.V.FUSE;THV060T-0800-0 60/70 SCREW	1	
M 25	73013-0194-00	BRACKET-H.V.C;SECC T0.8 W31 L125.8	1	
M 26	A1110-0027	C-OIL;CH-2101104B7N 115-J 2.1KVAC 3P	1	
M 27	77202-0080-00	TRANS-H.V;Y9245NTC M9245/MB245 230V 50HZ AC2230V	1	
M 28	76803-207-013	CUSHION-LAMP;P.U.T-FOAM T48 W10 L150 MB245	1	
M 29	73314-0154-00	COVER-CEILING;MICA SHEET T0.5 W62 L117 MB245	1	
M 30	72201-0035-00	BASE-PLATE;SGCC1-Z T0.8 W375 L588 MB245	1	
M 31	73004-0007-00	FOOT;PP(A353) BLK MW5630T	2	
M 32	76823-0048-00	MOTOR-SYNCHRONOUS;M2LJ24ZS52 220/240V50/60HZ M6235	1	
M 33	76803-207-014	CUSHION-LAMP;P.U.T-FOAM T40 W10 L340 MB245	1	
M 34	A3024-0009	SW-THERMO;NT-101NA(5XH)P 125V15A H 100/60 30MM	1	
M 35	70859-100-413	TAPE-DOUBLE FACE;DF 5712 T0.8X9W(TOYO-INK)	0	
M 36		ASSY CAVITY-C;1.1CU.FT MB245 COATING WHT	1	S. N. A
M 37	76803-207-012	CUSHION-LAMP;P.U.T-FOAM T40 W10 L170 M9245	1	

S. N. A : Service Not Available

Parts List - Door Parts

Ref. No	Parts No.	Description / Specification	Q'ty	Remarks
D 1	74043-0053-00	DOOR-FILM;P.E-FILM MW6630T T0.15 W174 L305	1	
D 2	74041-0042-01	DOOR-C;PP(TB53) GE-WHT 23.5G MW6730W	1	
D 3	74041-0071-00	DOOR-A;ABS(HR0370U) RA-WH-02-B 380G MB245	1	
D 4	74113-0033-02	SCREEN-DOOR(B);ACRYL T2.0 W257.8 L432.5 MB245(CTW)	1	
D 5	A0071-0077	TAPE-DOUBLE FACE;ACRYL T0.26 W15 WHT 3M-A-25-9242	0	
D 6	70544-0010-00	PIN-HINGE;PI4 L17 MSWR10 M301TBC	2	
D 7	74042-0065-01	DOOR-KEY;POM(TC3005) WHT 13G M6245	1	
D 8	72724-0036-00	SPRING-KEY;ES HSW3 PI0.7 D7.0/L40 BULING	1	
D 9	79341-0016-04	ASSY DOOR-E;MB245 COATING WHT	1	

Parts List - Control Parts

Ref. No	Parts No.	Description / Specification	Q'ty	Remarks
C 1	74082-0082-00	BUTTON-PUSH;ABS(HR0370U) RA-WH-02-B 30G M9245	1	
C 2	72724-0026-00	SPRING-BUTTON;CS SWP PI0.7 D17/L25.8	1	
C 3	76013-0073-00	MEMBRANE-PANEL;PC W93 L174.9 MB245	1	
C 4	79129-0566-00	ASSY P.C.B;230V50HZ M9245	1	
C 5	73323-0003-00	HOLDER DIGITRON;PP(JI350) BLK	1	
C 6	74073-0023-00	WINDOW-DISPLAY;ACRYL(HI855M) RC-SM-04-K 82555 20G	1	
C 7	74051-0049-00	CONTROL-PANEL;ABS(HR0370U) RA-WH-02-D 180G MB245	1	

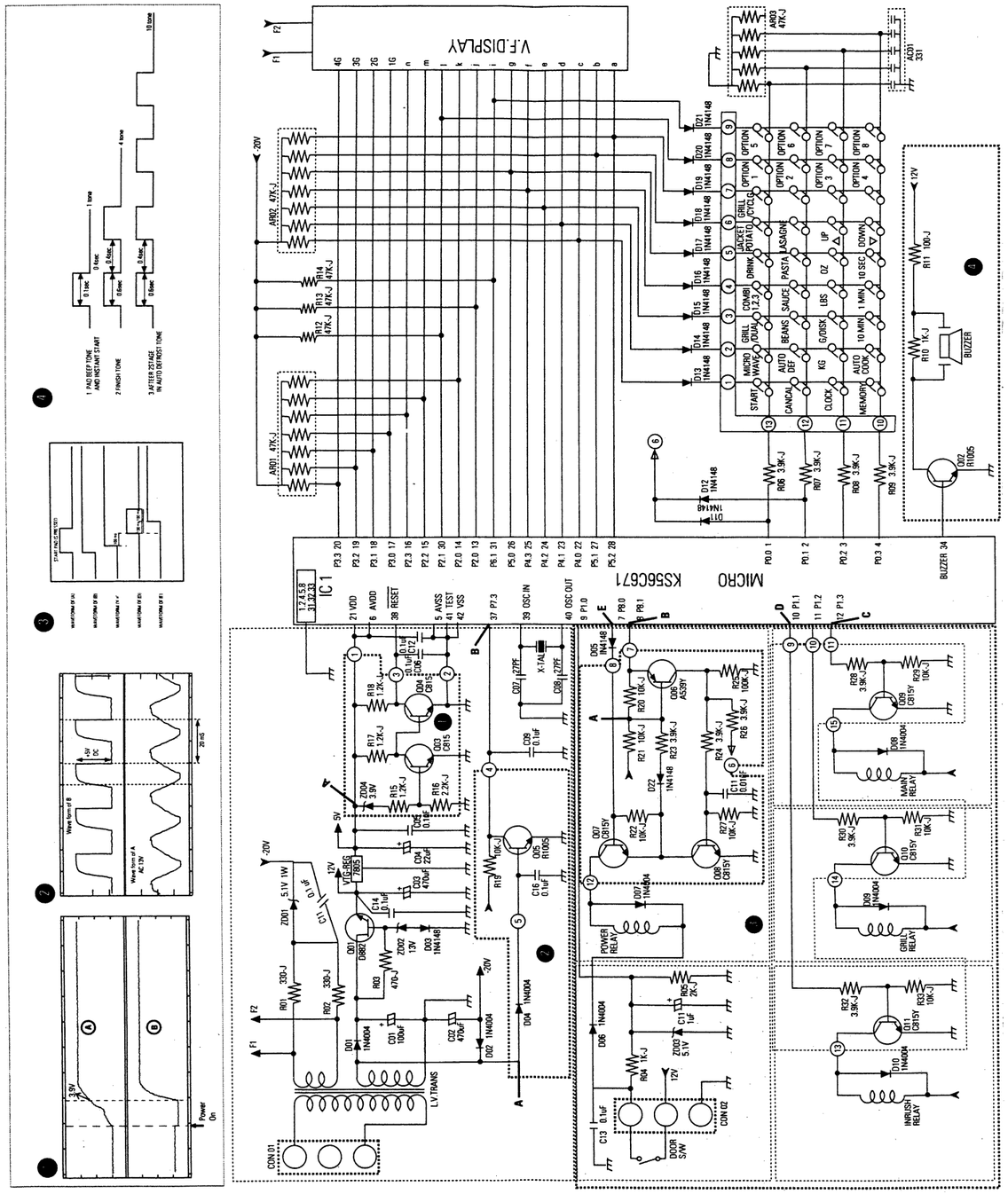
Parts List - Body Latch Parts

Ref. No	Parts No.	Description / Specification	Q'ty	Remarks
B 1	71533-0012-00	LEVER-SWITCH(B);POM 12G NTR MX245	1	
B 2	71533-0011-00	LEVER-SWITCH(A);POM 10G NTR MX245	1	
B 3	73579-203-207	SW-MICRO;VP533A-OF P,S(T85)	1	
B 4	73579-203-278	SW-MICRO;VP-531A-OF(T85)	1	
B 5	73579-203-207	SW-MICRO;VP533A-OF P,S(T85)	1	
B 6	72681-0001-00	LATCH-BODY;POM 50G MX245	1	

Parts List - Standard Parts

Parts No.	Description / Specification	Q'ty	Remarks
70504-0002-00	SCREW-TAP TITE;TH + 3 M4 L10 SWR10 ZPC2 TOOTH	1	GND
70504-0002-00	SCREW-TAP TITE;TH + 3 M4 L10 SWR10 ZPC2 TOOTH	3	FAN
70504-0002-00	SCREW-TAP TITE;TH + 3 M4 L10 SWR10 ZPC2 TOOTH	1	BASE
70504-0002-00	SCREW-TAP TITE;TH + 3 M4 L10 SWR10 ZPC2 TOOTH	1	NOISE
77094-211-410	BOLT-FLANGE;MSWR3 M5X10 FE,FZY	2	UPPER
77094-211-410	BOLT-FLANGE;MSWR3 M5X10 FE,FZY	2	LOW
77108-530-061	SCREW-TAP PH;2S-3X6 FE,FZY	2	TCO
77108-940-081	SCREW-T/TITE;PH 4X8 FEFZY	2	MO/DRV
77128-140-086	SCREW-TAP TH;2-4X8SUS410.CR	2	CEILIN
77154-202-910	WASHER-SCREW;2S-5X12	4	HVT
77154-202-910	WASHER-SCREW;2S-5X12	4	MGT
77154-203-810	SCREW-A;2S-4X12(TOOTHED)	5	PN/OUT
77154-203-810	SCREW-A;2S-4X12(TOOTHED)	2	B/WAVE
77154-203-810	SCREW-A;2S-4X12(TOOTHED)	9	BASE
77154-203-810	SCREW-A;2S-4X12(TOOTHED)	2	B/LAT
77154-203-810	SCREW-A;2S-4X12(TOOTHED)	2	CN/BOX
77154-203-810	SCREW-A;2S-4X12(TOOTHED)	1	S/MGT
77154-203-810	SCREW-A;2S-4X12(TOOTHED)	2	C/BLOW
77154-203-810	SCREW-A;2S-4X12(TOOTHED)	1	B/HING
77154-203-810	SCREW-A;2S-4X12(TOOTHED)	1	HVC
77154-203-810	SCREW-A;2S-4X12(TOOTHED)	1	C/AIR
77154-203-820	SCREW-A;2S-4X12 FE FZY	1	MEM-PN
77328-204-001	WASHER-TOOTHED;B-4PI FE FZY	2	MO/DRV

PCB Diagram



Parts List - PCB Parts

Parts No.	Description / Specification	Q'ty	Remarks
77202-0082-00	TRANS-L.V;DY-9245STC M9245/MB245 230V 50HZ AC13/2.	1	
71018-227-102	R-CARBON;RD1/4P 1K-J	1	R04
71018-227-102	R-CARBON;RD1/4P 1K-J	1	R11
71018-277-101	R-CARBON;RD1/4TP 100-J	1	R10
71018-277-102	R-CARBON;RD1/4TP 1K-J	1	R10
71018-277-202	R-CARBON;RD1/4TP 2K-J	1	R05
71018-277-331	R-CARBON;RD1/4TP 330-J	1	R01
71018-277-331	R-CARBON;RD1/4TP 330-J	1	R02
71018-277-392	R-CARBON;RD1/4TP 3.9K-J	1	R06
71018-277-392	R-CARBON;RD1/4TP 3.9K-J	1	R07
71018-277-392	R-CARBON;RD1/4TP 3.9K-J	1	R08
71018-277-392	R-CARBON;RD1/4TP 3.9K-J	1	R09
71018-277-471	R-CARBON;RD1/4TP 470-J	1	R03
71018-277-472	R-CARBON;RD1/4TP 4.7K-J	1	R12
71018-277-472	R-CARBON;RD1/4TP 4.7K-J	1	R13
71018-277-472	R-CARBON;RD1/4TP 4.7K-J	1	R14
71097-001-005	R-NETWORK;M06-1-R47K 6E473JYV(TAPG)	1	AR03
71097-001-007	R-NETWORK;M08-1-R47K 8E473JYV(TAPG)	1	AR01
71097-001-007	R-NETWORK;M08-1-R47K 8E473JYV(TAPG)	1	AR02
71417-065-270	C-CERAMIC;CC45SL(TAPG)50V 27PF-K	1	C07
71417-065-270	C-CERAMIC;CC45SL(TAPG)50V 27PF-K	1	C08
71607-402-004	C-ELEC;CE 0.4W(TAPG)50V 1UF	1	C10
71607-402-033	C-ELEC;CE 0.4W(TAPG)50V 22UF	1	C04
71607-402-293	C-ELEC;CE0.4W35V1000UF(TAPG)	1	C02
71607-402-294	C-ELEC;CE0.4W35V470UF(TAPG)	1	C03
71607-402-294	C-ELEC;CE0.4W35V470UF(TAPG)	1	C03
72147-301-431	TR-POWER;KSD882Y(TAPG)	1	Q01
72163-200-010	DIODE ZENOR;1W 5.1V	1	ZD01
72163-200-010	DIODE ZENOR;1W 5.1V	1	ZD03
72169-201-001	DIODE-RECTIFIER;1N4004	1	D02
72169-201-001	DIODE-RECTIFIER;1N4004	1	D04
72169-201-001	DIODE-RECTIFIER;1N4004	1	D06
72169-201-001	DIODE-RECTIFIER;1N4004	1	D07
72169-201-001	DIODE-RECTIFIER;1N4004	1	D08
72169-201-001	DIODE-RECTIFIER;1N4004	1	D09
72169-201-001	DIODE-RECTIFIER;1N4004	1	D10
72169-201-001	DIODE-RECTIFIER;1N4004	1	D22
73349-202-120	CONNECTOR;JST B3B-XH-A/2521P03V000	1	CON02
74537-001-001	RESONATOR-CERAMIC;CSA 4.19MG(TAPG)	1	
76029-0275-00	P.C.B-MAIN;FR-1 T1.6 W88 L163 M9245	1	
77199-0113-00	MICOM;KS56C671-09 MB245/M9245 DIP	1	
A1100-0340	C-CERAMIC;CK OA Y5V 50V T 104-Z UP050F104ZBB	1	C05
A1100-0340	C-CERAMIC;CK OA Y5V 50V T 104-Z UP050F104ZBB	1	C06
A1100-0340	C-CERAMIC;CK OA Y5V 50V T 104-Z UP050F104ZBB	1	C09
A1100-0340	C-CERAMIC;CK OA Y5V 50V T 104-Z UP050F104ZBB	1	C11
A1100-0340	C-CERAMIC;CK OA Y5V 50V T 104-Z UP050F104ZBB	1	C12
A1100-0340	C-CERAMIC;CK OA Y5V 50V T 104-Z UP050F104ZBB	1	C13
A4060-0008	TR-W/RESISTOR;KSR1005 300MW 100MA 50V EBN/4.7KR1	1	Q02
A4100-0003	DIODE-SW;1N4148 1.2V 4.0NS T	1	D03
A4100-0003	DIODE-SW;1N4148 1.2V 4.0NS T	1	D05
A4100-0003	DIODE-SW;1N4148 1.2V 4.0NS T	1	D11
A4100-0003	DIODE-SW;1N4148 1.2V 4.0NS T	1	D12
A4100-0003	DIODE-SW;1N4148 1.2V 4.0NS T	1	D13
A4100-0003	DIODE-SW;1N4148 1.2V 4.0NS T	1	D14
A4100-0003	DIODE-SW;1N4148 1.2V 4.0NS T	1	D15
A4100-0003	DIODE-SW;1N4148 1.2V 4.0NS T	1	D16
A4100-0003	DIODE-SW;1N4148 1.2V 4.0NS T	1	D17
A4100-0003	DIODE-SW;1N4148 1.2V 4.0NS T	1	D18
A4100-0003	DIODE-SW;1N4148 1.2V 4.0NS T	1	D19
A4100-0003	DIODE-SW;1N4148 1.2V 4.0NS T	1	D20
A4100-0003	DIODE-SW;1N4148 1.2V 4.0NS T	1	D21
A4106-0083	DIODE-ZENER;UZP-13B 12.4/14.1V 20MA T	1	ZD02
A6010-0468	CONNECTOR-WAFER;YW396-03AV WHT	1	CON01
B1113-0008	C-NETWORK;CX EXFFP7331MDV 50V 331X7-M 8P	1	AC01
A1305-0012	BUZZER;CBE2220BA STICK	1	
A3068-0086	RELAY;CS-1PD-1 DC12V16A	1	POWER
A3068-0086	RELAY;CS-1PD-1 DC12V16A	1	MAIN
A3068-0086	RELAY;CS-1PD-1 DC12V16A	1	INRUSH
A4008-1092	IC-VOLT REGU;KA7805A TO-220AB 1A 0/125C	1	
A4010-0053	IC-HYBRID;SMW002 MB245 SIP	1	
A4153-0079	V.F.DISPLAY;SVM-4SM01 MWO	1	
A6010-0076	CONNECTOR-WAFER;FCZ254-13S	1	